RESEARCH ARTICLE

Intentions Towards Adoption of Sanad App Services: Exploring The Technology Acceptance Model in A Covid-19 Scenario

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ARTICLE INFO	ABSTRACT
   	This study examines the relationship between users' intentions towards the government application "Sanad" in Jordan and individuals' fear of COVID-19. The fear element was incorporated into the TAM model to assess its impact on users' behavior. The study included 488 respondents, and the results showed a positive relationship between individuals' fear of the virus and their reliance on using the application. It was also found that ease of use and usefulness of the services provided were mediating factors in this relationship. The study highlights the importance of digital technology in enhancing e-government services during crises, providing a theoretical framework for understanding users' behaviors in light of the Corona pandemic. The originality of the study is evident in presenting an innovative model to understand individuals' behavior towards technology during the COVID-19 pandemic, where fear of the virus is integrated into the Technology Acceptance Model (TAM). This integration reflects the influence of psychological and social factors on individuals' decisions to adopt digital services. The contribution is to provide new research and applied insights into the impact of health crises on individuals' behavior, with a focus on the SANAD application and how technology can meet the needs of society in times of crisis. This study is important in light of rapid digital transformations, as it shows that health concerns can be a driver for technology adoption

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INTRODUCTION

The World Health Organization has classified the infectious virus COVID-19 as a worldwide pandemic (Dalglish, 2020). The coronavirus known as COVID-19 virus 2019 (2019-ncov or Covid-19), which was initially identified as novel coronavirus pneumonia (NCP), has significantly impacted individuals all throughout the world. According to Zhou et al. (2020), this coronavirus is the seventh to be linked to a human disease. On December 31, 2019, Wuhan, located in China's Hubei province, announced the emergence of a cluster of unknown cases of pneumonia. Since the highly contagious coronavirus disease first emerged in Wuhan, China, it has spread worldwide. Irani and Andjarwati (2020) reported that 198 countries have confirmed cases of COVID-19.

The World Health Organization has implemented several preventive measures and fundamental guidelines that have to stopped the spread of the coronavirus. These include closing places of worship, movie theaters, retail stores, sensory conferences, and different sports facilities. Regional quarantine, strict social borders, and physical and social isolation were among the other initiatives. Cities were cut off as a result, and public relations restrictions even affected daily living. Countries had a variety of health, economic, and societal difficulties as a result of the COVID-19 epidemic.

This demonstrated the urgent need to consider the psychological effects of COVID-19 in addition to the physical symptoms, as the number of new COVID-19 patients increased quickly and caused challenges for those attempting to provide systematic health services. Everyone impacted by these disruptions suffered the grave effects of losing both their mental and physical health. (Zhou et al., 2020; Shigemura, Ursano, Morganstein, Kurosawa, & Bendik, 2020).

All countries have already conducted nationwide screenings for psychological indicators associated with COVID-19. Government throughout the globe, such as Australia, China, and Singapore, have express their concern about the negative effects of isolation. and the way the pandemic has raised public anxiety. They have also drawn attention to COVID-19's psychological effects. (Lai, 2020; Zhang, Wu, & Rashid, 2020). Given their increased likelihood of interacting with infected individuals, patients, medical professionals, and "non-clinical staff" may be at risk of psychological distress even if they are not infected with COVID-19. Other factors that may contribute include depressive symptoms, anxiety, stress, and irritability.

In June 2020, 369 deaths from COVID-19 were reported, and more than 69,761 healthcare professionals were found to be infected in the United States (Covid and Team, 2020). Medical professionals accounted for 10% of all those affected in Europe (Grover et al., 2020). According to Babin et al. (2020), a large part of the population is experiencing high levels of anxiety, insomnia, and hopelessness resulting from the COVID-19 pandemic.

Medical workers have been particularly affected by the COVID-19 scenario because they spend a lot of time caring for infected patients and are more vulnerable to suicidal thoughts (Drissi et al., 2020; Smith, 2020). According to Smith (2020), two health workers committed suicide in Italy: one while waiting for COVID-19 test results, and the other after testing positive. Therefore, maintaining mental health is extremely difficult throughout the COVID-19 pandemic. People's stress and anxiety levels have escalated due to the coronavirus, which has also exacerbated the problems of the global health system. The importance of the advantages of the current era of technological innovation has emerged.

The proper use of disease-related technologies will be essential to protect and cope with the post-COVID-19 future. More specifically, Bahri et al. (2020) state that e-services are technically acceptable and feasible to assist patients, family members, and clinicians during this pandemic. The World Health Organization recognizes e-health as the use of information and communication technology to improve healthcare systems., promote innovation in the delivery of healthcare and in the management of the system, awareness and education of workers in administration and health care, and consumers, and connect providers, patients, and governments (Hoque, Bao, & Sorwar, 2017).

Mobile apps, internet telemedicine, hospital information systems, and electronic medical records are some examples of e-technology tools and applications that are critical resources for improving citizen safety and quality of service delivery cost-effectively (Shekelle, Morton, & Keller, 2006).

According to the government, these services save money, time, energy, water, and location while also assisting in the reduction of total public expenses. E-services save time, effort, and money for all nationals and residents, including visitors, employees, and investors. Individuals and the government will benefit from both sides of the equation. The primary topic that many studies have tackled with

regard to this matter is, " Why don't people use these services?" and " How can we make it easier for citizens to access services provided by government?"

Therefore, the purpose of the research is to show how providing e-services to the general public can benefit those who feel lonely, anxious, fearful, or apprehensive about COVID-19. There are many different types of stakeholders in the e-government field, each with their own experiences, opinions, and beliefs. It is important to understand the user's perspective during the adoption of e-services and related tactics (Norman and Skinner, 2006).

Many academics have forecast the variables that affect people's adoption of e-government services in the present period using various models. For this reason, it is important to assess the applicability, effectiveness, and feasibility of adoption theories, such as the Technology Acceptance Model, used in our current study. When the Covid-19 epidemic first started to spread over the world, using the SANAD program became legally necessary. Although the e-government application (SANAD) is still in its early stages, government-led communications through the media (such as the Internet, TV channels, social media, newspapers, and radio) have also had a comprehensive impact in shaping individuals' behavior towards using the (SANAD) application, especially in times of crisis.

This study focuses on the SANAD mobile application, which offers over 200 electronic services and is an e-government app https://www.sanad.gov.jo/Default/AR. Across ministries and civil bodies for the benefit of Jordanians, citizens, visitors, and investors. This program is similar to a widely known application in the European Union: Tawakalna application, Used inside the Saudi Arabian Kingdom. Alsaad, Al-Okaily.(2021).
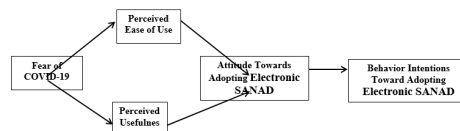
2. THEORETICAL FRAMEWORK

2.1 proposed model

Based on the expanded TAM model, the proposed framework is

shown in Figure 1, with an exogenous variable Fear is COVID-19, and accordingly the model consists of the following basic elements: perceived ease of use, perceived usefulness, Attitude towards Adopting electronic SANAD application and behavior intentions toward adopting electronic SANAD application, from the (TAM). The model indicates that the study components/variables influence attitude, which in turn influences intention to use, which in turn influences intention to use the application. The model shown in Figure 1 will be discussed.

The Technology Acceptance Model was used to find the relationship between people's behavioral intentions and attitudes towards adopting the electronic services of the SANAD application and their fear of Covid-19

Shape 1 represents the theoretical framework of the study. The model shows that people's intents to use SANAD e-services are strongly connected with their fear of COVID-19 through the ease of use, perceived value, and adoption behavior of SANAD e-services.

Figure-1. Theoretical framework.

Source-based: Technology Acceptance Model (TAM) developed by Fred Davis in 1989.

2.2 THEORY AND HYPOTHESES DEVELOPMENT (TAM) is widely used in the field of technology adoption (Venkatesh, 2000). There are several theories that have been widely used in this field about

technology acceptance: Theory of Planned Behavior (TPB), Theory of Reasoned Action (TRA), and Unified Theory of Acceptance and Use of Technology (UTAUT) and TAM (Venkatesh, 2000) (Yu, 2012). Based on previous studies, according to Kapoor, Dwivedi, and Williams (2014), TPB, TRA, and UTAUT models have common characteristics.

Several previous studies have shown that the Technology Acceptance Model (TAM) excels in the ability to predict the behavioral intentions of individuals compared to both the theory of planned behavior and the theory of intentional action (Chang et al. 2020). This model also highlights individuals' reliance on technology, considering the impact of external variables, especially those related to consumer perception, during the stages of adoption and personal use.

According to Hoque et al. (2017) and Tao et al. (2020), the (TAM) is the preferred model for technology adoption in many sectors, including e-services.

Thus, in order to support our theoretical framework, we used a TAM model in this study. According to Davis (1989), TAM is a crucial paradigm that demonstrates a willingness to embrace technology and the capacity to specify how users would utilize tools like e-health services. According to TAM, perceived usefulness (PU) and system ease of use (PEU) may have an impact on their intention to adopt e-services (Davis & Venkatesh, 2004). The (TAM) is a valuable theory that has gained prominence in e-government research because to its ability to assess consumer technology adoption (Sarwar, Zulfiqar, Aziz, & Ejaz Chandia, 2019; Davis & Venkatesh, 2004; Amadu, Muhammad, Mohammed, Owusu, & Lukman, 2018).

The (TAM) has been used in a range of contexts and has been evaluated in several empirical studies on e-service adoption (Kang & An, 2020; Alsharo, Alnsour, & Alabdallah, 2020). The (TAM) in this study is believed to represent the relationship between people's attitudes and intentions to use the SANAD app and their fear of COVID-19. The researcher believes that the ease of use of the SANAD application and the perceived usefulness (PU) are the underlying processes between people's attitudes and behavioral intentions to adopt the app and their fear of COVID-19.

The (TAM) is utilized in this study to explore how the COVID-19 pandemic affects SANAD app adoption, contributing to the theoretical literature on SANAD app adoption behavior and shedding light on the relationship between people's attitudes, intentions, and concerns about the COVID-19 pandemic.

Perceived usefulness (PU) and ease of use (PEU) were therefore included to the study as research factors.

2.2.1 Fear of COVID-19: On December 12, 2019, the novel coronavirus disease, known as COVID-19, first appeared in Wuhan, Hubei Province, China. Researchers have confirmed that COVID-19 spreads through multiple means and causes anxiety in people. For example, Ahorso et al. (2020) claimed that fear and anxiety are caused by the outbreak of COVID-19 and its pandemic nature.

Zhang, Wu, Zhao, and Zhang (2020) state that anxiety and fear associated with COVID-19 may result in social stigma and exclusion of patients, infected individuals, their family members, and other individuals associated with the disease. This, in turn, may lead to an increase in mental health disorders like depression and maladjustment, which may put these individuals at risk. In addition to causing a variety of fears, including emotions of uncertainty, health worries, and threat to loved ones, COVID-19 also highlights two significant issues: a higher level of anxiety and a higher risk of being ill (Gerhold, 2020; Ahorso et al., 2020).

Additionally, Lin (2020), discussed the impact of COVID-19 and noted that uninfected individuals fear interacting with other infected individuals. It is important to understand how higher levels of fear of COVID-19 affect and can additionally causes irrational and vague thoughts (Ahorso et al., 2020),

(Xiang et al., 2020). From the above, the researcher believes that a clear explanation for the continuation of mental health treatment during the pandemic is the use of web-based interventions, video conferencing, and psychotherapy to provide electronic care across distances.

Based on the previous theoretical discussion, the current study explores the relationship between e-government application service adoption under the (TAM) and the effect of fear of COVID-19 as an external factor. In addition, this research seeks to study the limitations of the TAM model and the external factor by analyzing how fear of COVID-19 affects usage behaviors.

Based on the previous discussion, the researcher hypothesizes the following:

H1a: There is a positive association between fear of COVID-19 and individuals' ease of use of the SANAD electronic application.

H1b: There is a positive correlation between the fear of COVID-19 and the benefits that individuals realize from using the Sanad app.

According to Davis (1989), perceived ease of use (PEU) refers to "the extent to which an individual believes that the use of a particular information system will be effort-free" and "how easy it is to control, as well as the simplicity of understanding and operation" (Ali and Younis, 2013). Furthermore, to its impact on adoption, the (TAM) posits that individuals' perceptions of the ease of use of a technology also influence their assessment of its value. In addition to affecting adoption, the (TAM) postulates that an individual's perception of a technology's ease of use also affects their evaluation of its value. According to Sun and Rau (2015), if a user can easily use technology without having to put in extra effort, then there will be a high level of adoption.

Gefen (2000) states that people's acceptance of technology is directly influenced by ease of use. Previous studies have shown that perceived ease of use significantly influences individuals' willingness to adopt and use certain techniques. Research on the diffusion of e-service applications in developing countries suggests that this ease has a positive impact on technology acceptance and use (Faqih and Jaradat, 2015). According to previous studies, including a study on technology acceptance using the (TAM), perceived ease of use is a key factor influencing effective technology adoption (Borges and Kubiak, 2016). Based on this, the following hypothesis was formulated.

H2a: The ease of use of the SANAD application by an individual is positively related to his attitude towards adopting the SANAD application.

Davis (1989), defines perceived usefulness as an individual's expectation the use of a particular system will contribute to improving their job performance within an organizational context. Through this perception, individuals learn how to use or refrain from using information systems based on their belief that doing so will enhance their productivity and efficiency at work. Ma and Liu (2004), King and He (2006), Schepers and Wetzels (2007), and other scholars have also pointed out that perceived usefulness is a major driver of technology adoption over time. Similarly, Hoque et al. (2017) found that:

Individuals' willingness to use e-services was significantly influenced by perceived usefulness (PU), based on their examination of factors influencing the acceptance of these services in emerging countries. The research indicates that there may be a fundamental relationship between attitude toward accepting e-services and perceived usefulness of technology adoption (Zobair, Sanzogni, & hu, 2019; Schepers & Wetzels, 2007). Based on this, it is suggested that the following hypothesis be tested:

H2b: Individuals' perceived usefulness of the SANAD e-application is positively related to their attitude toward adopting it.

2.2.2. The mediating role of perceived ease of use and perceived usefulness

In the evaluation of the technology acceptance model, ease of use and perceived usefulness are the most important components of technology adoption. Any technology that meets these two criteria will be accepted by the public. For a user to adapt to a technology, there are some basic external factors, including information quality, privacy, security, and trust. In light of the current circumstances, in this study, we explore the impact of individuals' concerns about COVID-19 on their attitudes and behavioral intentions toward using SANAD e-services. The results showed that people became more avoidant of crowded places after the COVID-19 pandemic. Significant empirical evidence has been collected to support the idea that people's attitudes toward adopting e-application services are based on people's perceptions of the benefits and ease of use of these applications (SUH & HAN, 2003; Taylor & Todd, 1995; Bobbitt & Dabholkar, 2001). Based on the aforementioned literature, for the current study we propose:

H3a: Individuals' perceptions of the ease of use of the SANAD app mediate the relationship between their concerns about COVID-19 and their attitude toward adopting this app.

H3b: Individuals' perceptions of the usefulness of the SANAD app mediate the relationship between their concerns about COVID-19 and their willingness to use this app.

2.2.3. Attitude towards adopting SANAD electronic application services

 The attitude towards implementing SANAD electronic application plays a fundamental role in determining the extent of acceptance of the technology and adoption of the application. Previous research has discussed this (De BIE, Van Wijngaarden, Hofst EDE, Heijmans, 2014; (Davis, 1993) defines it as the extent to which a person evaluates the target system and associates it with his or her goals. Many studies have found that it is necessary to understand how social and human factors influence individuals' acceptance of adoption situations, which often stem from feelings of fear and anxiety (Chen & Hsiao, 2012; Sharifi et al., 2013). Evidence suggests that people who perceive the benefits and use of the SANAD e-app are more likely to use it. Accordingly, the current research finds that consumers' intentions to use the app increase as the benefits and convenience they perceive increase (Aggelidis & Chatzoglou, 2009; Alam, Hoque, Is, & Parwa, 2020). According to previous studies, perceived usefulness and ease of use influence the terms of use of online applications (KIM, Han, Yoo, & Yun, 2012). Our hypotheses were Consistent with previous research showing the influence of relevant factors on people's adoption of technology such as (Khan, Liu, Rasheed, 2020; Nand, Begitave, Kanwal, Begitave, Rasheed, 2020). We should look at the external factors that lead people to fear COVID-19 and its impact on the adoption of e-apps. According to the research by Venkatesh, Thong, and Xu (2016), attitudes toward adopting e-services and individuals' behavioral intentions to accept e-health services are positively related. Furthermore, according to the research by Gadabu et al. (2019) and the above studies, it can be said that: H4: Individuals' attitudes toward adopting the SANAD e-app are positively related to their intentions to use the SANAD e-app.

3. Research Methodology

In current study, a quantitative technique was used to explore users' intentions towards adopting the services of the "SANAD" application, by analyzing technology acceptance model within COVID-19 context outbreak. The research design was based on a survey method, targeting users who seek to adopt the services of this e-government application in Jordan.

3.1 Population and sample

The purpose of the study is to encourage trial participants to use the SANAD application. To obtain a representative sample, simple random sampling was used, ensure that all members of the study population have an equal opportunity to be selected. We conducted a comprehensive survey of the general public in Jordan to obtain data and evaluate our experimental research approach. Using the structural equation modeling method, the study used SPSS and Smart PLS for testing. The link to the

online survey was sent to the participants through email and social media sites., contacts and social media. Each participant received pledges about data security and identity privacy before completing the survey. Participants were informed through the questionnaire that the information they provided would be used for research purposes only, and the researcher assured them of ethical standards. These measures helped reduce the variability that typically occurs when using traditional data collection methods. Rasheed, Okumus, Wing, Hamid, and Nawaz (2020) and Sattar, Rashid, Khan, Tariq, and Iqbal (2017) have pointed out this. We distributed 624 online surveys, 488 (78%) questionnaires which were retrieved. There were no missing data because the survey was conducted online and had these limitations

3.2 Study Instrument

Each measure used in this theoretical construct was modified to make sense in the context of the study after being taken from previous studies. (TAM) scales used by Davis (1989) and researchers Zhao and Hu (2002), Chismar, W. G., & Wiley-Patton, S. (2003), Venkatesh (2000), Venkatesh-Odavis (2000), and Venkatesh and Morris-Odavis (2003) have been updated to include perceived usefulness, perceived ease of use, attitude toward using the SANAD application, and intentions to use the application's services.

The research used a five-point Likert scale for measurement purposes where 1 indicates strongly disagree, while 5 indicates strongly agree.

Fear of COVID-19: Results of Ahorso et al.'s (2020) study were used to assess fear of COVID-19 with some modifications, using four questions to measure participants' level of fear of the virus. Examples of typical responses included: "I feel more afraid of COVID-19," "It makes me feel uncomfortable," and "When I think about COVID-19, my hands sweat."

Perceived Ease of Use: A four-item scale was used to measure perceived ease of use. It would be appropriate to ask questions such as "My interaction with the SANAD app will be clear and understandable" and "It will not require much mental effort on my part to interact with the SANAD app system."

Perceived usefulness: We measured perceived usefulness using a 4-item scale "SANAD e-services make our lives much easier" "SANAD e-services will enhance my quality of life" are two examples of sample items. The alpha reliability of this scale.

Attitude toward Usage: The attitude toward usage was assessed using a five-item scale. "Using SANAD App e-services would be a good idea," "In general, such as I have a positive attitude towards using SANAD App e-services," along with "Using SANAD App e-services would be good" were a few instances of sample items.

Intention to use: Based on behavioral intentions related to using the SANAD e-app, a four-item scale was used, where participants were asked to indicate whether they have a "strong intention to use the SANAD app service," "want to learn how to use the SANAD app services," and "plan to use the SANAD services to manage their lives. It would be appropriate to ask questions such as: "I intend to continue using SANAD's electronic services in the future." "I will recommend others to use SANAD's electronic application services." This scale is used to assess usage intention.

The degree of agreement or disagreement is measured using a five-point Likert scale, with participants' answers falling between "strongly agree" and "strongly disagree." With intermediate alternatives in between, the scale awards a score of 1 for "strongly disagree" and a score of 5 for "strongly agree." The Likert scale processing follows the method of Shmueli (2016), where the category length is calculated as 1.3 using the following equation: (5-1)/3. Accordingly, the averages are classified as follows:

Low level: average between 1 and 2.33

Medium level: average between 2.34 and 3.67

High level: average between 3.68 and 5.00

4. Results

In this section, the study's findings obtained through data analysis using SPSS.26 and Smart PLS are presented. The hypotheses of the study were tested using basic linear regression, and the results are presented in the second section. In contrast, the first segment contained descriptive statistics pertaining to the respondents' demographic information.

4.1 Demographic data for respondents

The frequency and percentage of each respondents' demographic characteristics, in addition to descriptive statistics, the following table includes (1):

In terms of the distribution of participants by sex, the proportion of males was 59.2% (a total of 289 participants), while the percentage of females was 40.8% (a total of 199 participants). As for age, the largest group was between 31-40 years old, representing 36.3% (n=177) of the sample, followed by those aged 41 years and over, who accounted for 33.0% (n=161). Respondents aged

21-30 made up 24.0% (n=117), while the smallest group was those aged 18-20, comprising only 6.8% (n=33). In terms of SANAD app usage, 57.2% (n=279) reported using the app at different periods, while 16.4% (n=80) indicated that they no longer use it. Weekly users made up 13.9% (n=68), and 9.4% (n=46) used the app monthly. Daily users represented the smallest portion at 3.1% (n=15). The total sample size for the survey was 488 respondents.

Table No. (1) descriptive statistics of the demographic data of the respondents:

Gender	Frequency	Percent
Female	199	40.8
Male	289	59.2
Age	Frequency	Percent
18-20 years old	33	6.8
21-30 years old	117	24.0
31-40 years old	177	36.3
41 years and over	161	33.0
SANAD APP using	Frequency	Percent
Weekly	68	13.9
Monthly	46	9.4
At different periods	279	57.2
I don't use the app anymore	80	16.4
Daily	15	3.1
Total	**488**	**100.0**

4.2 Description of study variables

Table (2) displays the standard deviation, mean, and importance levels for the study variables. Among the variables, the fear of COVID-19 has the highest average score (M = 3.82, SD = 0.89) and is considered of High importance. The other variables are rated as having Medium importance. These

include behavioral intentions toward adopting the electronic SANAD application with a mean of 3.66 (SD = 0.85), perceived usefulness with a mean of 3.59 (SD = 0.79), attitude towards adopting the electronic SANAD application with a mean of 3.57 (SD = 0.90), and perceived ease of use with a mean of 3.55 (SD = 0.96). These findings indicate that while the perceived ease of use, usefulness, and attitude towards adoption are important, Fear of COVID-19 plays a more significant role in influencing the respondents' behavior.

Table (2): The mean, SD and rank study variables

Variable	Mean	Std. Deviation	Importance
Perceived ease of use	3.55	0.96	Medium
Fear of COVID-19	3.82	0.89	High
Perceived usefulness	3.59	0.79	Medium
Attitude towards Adopting electronic SANAD application	3.57	0.90	Medium
Behavior intentions toward adopting electronic SANAD application.	3.66	0.85	Medium

Table 3 demonstrates strong loadings of items on their respective constructs, confirming the measurement model's validity. Items for each construct—fear, ease, usefulness, attitude, and intention—show high loadings on their intended factors, with minimal cross-loadings on others. This pattern indicates clear separation between constructs, ensuring discriminant validity. Fear items load between 0.862 and 0.896 on Factor 1, ease items range from 0.733 to 0.898 on Factor 2, usefulness items load from 0.591 to 0.876 on Factor 3, attitude items range from 0.749 to 0.900 on Factor 4, and intention items load from 0.748 to 0.809 on Factor 5.

Table (3) Items loadings & cross loadings

Items	1	2	3	4	5
Fear1	0.869	0.108	0.11	-0.234	0.193
Fear2	0.874	0.125	0.127	-0.146	0.237
Fear3	0.896	0.216	0.223	0.258	0.258
Fear4	0.862	0.174	0.186	0.042	0.154
Ease1	-0.221	0.856	0.122	-0.25	0.291
Ease2	-0.187	0.831	0.211	0.272	0.137
Ease3	0.154	0.829	0.116	0.191	0.114
Ease4	0.194	0.898	-0.22	0.255	0.191
Ease5	0.356	0.733	-0.19	0.148	0.076
Useful1	0.125	0.116	0.815	0.035	0.184
Useful2	0.245	0.278	0.862	0.042	0.194
Useful3	-0.103	0.185	0.876	-0.157	0.195
Useful4	0.174	0.215	0.634	0.114	0.14
Useful5	0.001	0.158	0.591	0.021	0.141
Attitude1	-0.254	0.233	-0.227	0.852	0.192
Attitude2	0.106	0.149	0.161	0.865	0.18
Attitude3	0.159	0.213	0.176	0.749	-0.152

Attitude4	0.219	0.261	-0.127	0.886	-0.123
Attitude5	-0.23	0.147	-0.113	0.9	0.194
Intention1	-0.272	0.157	0.047	0.187	0.809
Intention2	0.297	-0.26	0.202	-0.014	0.771
Intention3	0.145	-0.187	0.193	0.241	0.748
Intention4	0.169	0.154	0.05	0.269	0.779

Normality Test

Before proceeding with the structural model and performing SEM, it is essential to evaluate the normality distribution of all items measuring the constructs. Given that SEM uses a parametric statistical approach, this assessment ensures the accuracy of the model. According to Awang et al. (2015), it is sufficient to verify that the skewness values for all items remain within an acceptable range, which is between -2 and 2. This indicates that the items do not significantly deviate from normality. The normality distribution assessment for all items is provided in Table 4.

Table (4): The Assessment of Normality for all Components (sub-constructs)

	Skewness		Kurtosis	
	Statistic	**Std. Error**	**Statistic**	**Std. Error**
Fear1	-0.783	0.111	0.155	0.221
Fear2	-0.779	0.111	0.298	0.221
Fear3	-0.654	0.111	-0.12	0.221
Fear4	-0.721	0.111	0.224	0.221
Ease1	-0.733	0.111	-0.215	0.221
Ease2	-0.649	0.111	-0.032	0.221
Ease3	-0.811	0.111	0.498	0.221
Ease4	-0.632	0.111	-0.354	0.221
Ease5	-0.829	0.111	-0.176	0.221
Useful1	-0.482	0.111	-0.474	0.221
Useful2	-0.054	0.111	-0.404	0.221
Useful3	-0.772	0.111	0.449	0.221
Useful4	-0.459	0.111	-0.316	0.221
Useful5	-0.886	0.111	0.331	0.221
Attitude1	-0.685	0.111	-0.163	0.221
Attitude2	-0.368	0.111	-0.167	0.221
Attitude3	-0.538	0.111	0.218	0.221
Attitude4	-0.544	0.111	-0.003	0.221
Attitude5	-0.837	0.111	0.538	0.221
Intention1	-0.847	0.111	0.669	0.221
Intention2	-1.059	0.111	1.253	0.221
Intention3	-0.746	0.111	0.536	0.221
Intention4	-0.845	0.111	0.592	0.221

4.4 Internal Consistency of Reliability

Reliability of internal consistency expresses the extent to which the scale components collectively represent the basic concept (Sun et al., 2007). Cronbach alpha coefficients and composite coefficients are essential tools in social research to assess the reliability of metrics and the degree of internal consistency, especially those containing multiple elements (Peterson and Kim, 2013). In current study, the researcher used Cronbach alpha to assess internal consistency of adjusted scales for specific reasons. However, composite reliability is a more accurate measure of reliability compared to Cronbach's alpha. According to Goetz et al. (2010), as it accounts for variations in the contribution of individual items to the construct. Cronbach's alpha assumes equal contributions from all items, which can lead to either an overestimation or underestimation of reliability. On the other hand, composite reliability considers the differences in item loadings, providing a more accurate assessment. The composite reliability factors in the studies, as evidenced by the data provided, show a high level of internal consistency. All values exceed the recommended minimum of 0.70, indicating that the measurement instruments used in the study have good reliability.

According to Hair et al. (2014), Convergent validity assesses the relevance latent construction indicators and their accurate representation of the intended construction. Convergent validity is measured using the Average Variance Extracted (AVE), which reflects the variance of the indicators used in the measurement. AVE refers to the percentage of variance explained by the factors studied, and is considered a basic indicator for evaluating the quality of a statistical model. According to the general rule established by Barclay and colleagues in 1995, the value of AVE must exceed 0.5 to confirm convergent validity the findings presented in Table 5 show: that all AVE values exceed this threshold, demonstrating the validity of convergence for all combinations studied in this study.

Items	Outer loadings	Cronbach's alpha>.7	Composite reliability >.6	Average variance extracted (AVE)>.5
Attitude towards		0.839	0.953	0.804
Attitude1	0.905			
Attitude2	0.881			
Attitude3	0.901			
Attitude4	0.886			
Attitude5	0.908			
Fear of COVID-19		0.798	0.944	0.659
Fear1	0.821			
Fear2	0.794			
Fear3	0.741			
Fear4	0.885			
Perceived ease of use		0.829	0.946	0.779
Ease1	0.848			
Ease2	0.819			
Ease3	0.911			
Ease4	0.933			

Ease5	0.898			
Behavior intentions		0.897	0.928	0.764
Intention1	0.881			
Intention2	0.818			
Intention3	0.912			
Intention4	0.882			
Perceived usefulness		0.859	0.899	0.641
Useful1	0.709			
Useful2	0.770			
Useful3	0.793			
Useful4	0.887			
Useful5	0.832			

Table (5) Reliability and internal consistency results

4.5 Discriminant Validity

Discriminatory validity refers to the ability of tests or scales to differentiate between individuals or items based on certain characteristics. This authority is a vital element in evaluating the effectiveness of measurement tools in multiple areas. Meaning that it does not overlap with other items and is empirically different from other constructs (Fornell & Larcker, 1981). In Smart-PLS, a set of criteria are used to assess discriminant validity, with the Fornell-Larcker method being one of the most common. A detailed explanation of this method will be provided in the next section. Discriminant validity is an essential element in analyzing the relationships between constructs measured in a reflective manner. By applying these criteria, the researcher can ensure that each construct in the model is distinct from the others, which enhances the reliability of the results drawn from the analysis.

4.6 The Fornell-Larker standard a key instrument for assessing discriminatory validity of a measurement model by analyzing correlations between variables. According to Fornell and Boxen (1982), discriminatory validity is achieved when the square root of the extracted mean variance (AVE) is higher than the correlations between the factors.

Correlation analysis results

The results of the correlation analysis in Table 6 showed that the extracted mean variance (AVE) was higher than the correlations, indicating that the variables have strong discriminatory validity. This enhances the reliability of the results and confirms that the variables are not only differentiated but reflect real variability in the data, making it easier to understand the relationships between the variables studied.

	Attitude towards	Fear of COVID-19	Perceived ease of use	Behavior intentions	Perceived usefulness
Attitude towards	0.896				
Fear of COVID-19	0.641	0.811			

Perceived ease of use	0.668	0.774	0.883		
Behavior intentions	0.76	0.839	0.626	0.874	
Perceived usefulness	0.697	0.87	0.704	0.732	0.800

Table (6). Variable Correlation-Root Square of AVE

4.7 Hypotheses Testing (Path Coefficient)

Hypothesis testing is an important tool for understanding the relationships between variables in research, the study was done by using structural equation modeling (SEM) as the main tool.

We used path coefficient analysis to evaluate the direction and strength of correlations between various structures, which aided in identifying direct and indirect relationships. This process is based on a set of basic statistics, such as the original sample (O), sample mean (M), standard deviation (STDEV), and t-statistics (|O/STDEV|), plus the p-values to determine how important relationships are. A p-value of less than 0.05 indicates a statistically significant one, reinforcing the validity of the hypotheses.

This section presents the findings from the path coefficient analysis, which contribute to enhancing understanding of intentions related to the adoption of SANAD application services, and explores the technology acceptance model during the COVID-19 pandemic.

Table (7): path coefficient

Hypo.	PATH	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
H1a	Fear of COVID-19 -> Perceived ease of use	0.474	0.414	0.075	6.327	0.00	**Accepted**
H1b	Fear of COVID-19 -> Perceived Usefulness	0.37	0.309	0.079	4.68	0.00	**Accepted**
H2a	Perceived usefulness -> Attitude towards	0.45	0.45	0.034	13.112	0.00	**Accepted**
H2b	Perceived ease of use -> Attitude towards	0.351	0.351	0.045	7.892	0.00	**Accepted**
H3a	Fear of COVID-19 -> Perceived ease of use -> Attitude towards	0.166	0.145	0.02	8.311	0.002	**Accepted**
H3b	Fear of COVID-19 -> perceived usefulness -> Attitude towards	0.166	0.139	0.035	4.746	0.001	**Accepted**
H4	Attitude towards -> behavior intentions	0.76	0.76	0.024	31.685	0.00	**Accepted**

Table (7) shows the hypothesis path coefficients tested in the study, highlighting the relationships between several variables such as fear of COVID-19, perceived ease of use, perceived benefit, attitude towards a particular behavior, and behavioral intentions.

The findings include a statistical analysis showing how these variables affect each other, contributing to an understanding of the behavioral dynamics associated with fear of the pandemic and how this affects the behavior of individuals.

H1a indicates a significant relationship between fear of COVID-19 and perceived ease of use, with the original sample path coefficient of 0.474 and a t-statistic of 6.327, which leads to accepting this hypothesis.

H1b: shows that there is a marked impact of fear of COVID-19 on the perceived benefit, with the data indicating a pathway coefficient of 0.37, demonstrating a positive relationship between fear of the virus and an increase in perceived benefit. In addition, the t-statistic is 4.68, which enhances the strength of this effect and makes it statistically acceptable.

In **H2a**, it turns out that the effect of perceived usefulness on the attitude towards behavior is considered very positive and significant. The results showed a pathway coefficient of 0.45, demonstrating a strong correlation between perceived usefulness and attitude towards the use of technology. In addition, the t-statistic of 13,112 reinforces the significance of this effect, suggesting that individuals who recognize certain benefits of technology have more positive attitudes towards its use.

The path from perceived ease of use to attitude towards behavior was also accepted in

 H2b, with a coefficient of 0.351 and a t-statistic of 7.892.

H3a and H3b explore the intermediate effects of both perceived ease of use and perceived usefulness on the relationship between COVID-19 fear and attitude towards behavior. The results suggest that both ease of use and perceived usefulness play an important and acceptable role in shaping attitude towards behavior, with pathway coefficients of 0.166 with t-statistics of 8.311 and 4.746, respectively, demonstrating the strength of the relationship and its positive impact. As for H4, the results showed a strong and positive relationship between attitude towards behavior and behavior intentions, with a track coefficient of 0.76 and a t-statistic of 31.685. This reflects the importance of the relationship between attitude and behavioral intentions, making it highly statistically significant and highly acceptable. Overall, these results suggest that attitudes towards a particular behavior are significantly influenced by fear of COVID-19 and that these attitudes in turn positively influence individuals' intentions to take on certain behaviors.

4.8 Coefficient of Determination ($R2$) Value

Coefficient of Determination *($R2$)* is calculated when a correlation between two variables is present. In this study, the smart PLS   algorithm is used to determine the *$R2$* values, which are displayed in Table 8 and illustrated in Figure 1.
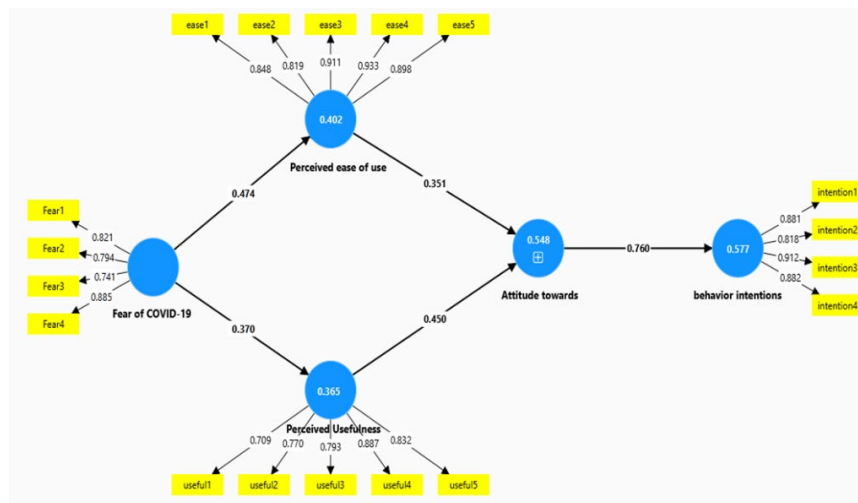
Figure (1): Full Model of relationship between IV, Mediators and DV

Table (8): R-Square of the Endogenous Latent Variables

	R-square	R-square adjusted
Attitude towards	0.548	0.546
Perceived ease of use	0.402	0.4

Behavior intentions	0.577	0.576
Perceived usefulness	0.365	0.353

4.9 The Effect Size ($F2$) Value

After determining the importance of the relationships between the constructs, we show the importance of assessing the relevance of these important relationships (Hair et al., 2014). The relationships between the constructs are of great importance, and it is necessary to assess their relevance. This can be achieved through an effect size analysis, according to Cohen's (1988) guidelines. Impact size, known as F^2, is used to assess the effect of predictive construction on internal structure. In particular, F2 shows the extent to which the exoskeleton aids in the comprehension of its internal structure.

According to Cohen's classification (1988), f2 values are classified into three categories:

• Mini Effect: F2≥0.02 F2≥0.02

• Moderate effect: f2≥0.15f2≥0.15

• High Impact: f2≥0.35 f2≥0.35

These classes help to understand the strength of the relationship between variables in Study.

Table 9 presents the analysis of the $F2$ effect size coefficient for each relationship.

Table 9. Effect Size of the Exogenous Constructs

	F-square	**Effect size**
Attitude -> intention	1.364	Large
Fear -> ease	0.119	Medium
Fear -> useful	0.217	Medium
Ease -> Attitude	0.138	Medium
Useful -> Attitude	0.226	Medium

3 Predictive Relevance and Blindfolding (Q^2) Value

The predictive significance of the model is assessed by opacity procedure, a technique used in systematic re-sampling, data points are removed from indicators in the internal construction reflective measurement model. This procedure is part of probabilistic sampling methods, as it aims to reduce bias and ensure an accurate representation of the target population. This method should only be applied to endogenous constructs that have been measured reflectively (Hair Jr et al., 2016). According to Cohen (1988), if Q^2 values are greater than 0, this indicates that the model has predictive significance for the endogenous construct in question. We can see from the table that Q^2 values are greater than (0).

Table 10. Predictive importance of internal latent variables

	Q^2predict	
Attitude towards	0.353	**$Q^2 > 0$**
Perceived Usefulness	0.585	**The variable explaining gives predictive relevance**.
Perceived ease of use	0.344	
Behavior intentions	0.477	

5. Outcome discussion

Based on the above, there is an increasing likelihood of using SANAD e-services. This study was conducted to explore the impact of the COVID-19 pandemic on individuals' adoption of SANAD electronic services. The research relied on the expanded Technology Acceptance Model (TAM) to determine individuals' attitudes and behavioral intentions towards using these services in light of the anxiety resulting from COVID-19. This research aims to understand how feelings of fear of the Corona virus are related to people's attitudes and behavioral intentions towards adopting SANAD electronic services. The study examines the potential relationships between fear of COVID-19 and perceived ease of use, perceived usefulness, as well as attitude and behavioral intentions towards adopting SANAD electronic services. The theoretical hypotheses in our research were tested using data analysis tools such as SPSS and Smart PLS, and the results of the path analysis showed support for all hypotheses. We hypothesized that there is a strong relationship between fear of COVID-19 and perceived ease of use and perceived usefulness among individuals and assumed the effect of these variables on adoption. The results of the study indicate that fear of COVID-19 is significantly related to perceived ease of use and perceived usefulness of SANAD electronic services during the pandemic period. This means that individuals who are afraid of COVID-19 tend to have positive attitudes and behavioral intentions towards using these services. These findings support previous studies that suggest that eHealth services are used to address individual health concerns during the COVID-19 outbreak (Tebeje & Klein, 2020). Taarnhøj and Pappot (2020) also pointed out that these services meet patients' needs for information and maintaining social contact during isolation periods during the pandemic.

In addition, we conclude that there is a substantial relationship between an individual's attitude and behavioral intentions to adopt e-services after the COVID-19 outbreak, as studies have shown (Kim et al., 2009). Zayyad and Toycan (2018) also confirm that knowledge and experience in the field of information technology, in addition to attitudes and desires, play a decisive role in their intention to use e-technology applications.

Our findings contribute significantly to the field of e-services by being employed in and building on the TAM model. For example, we found significant relationships between perceived ease of use, perceived usefulness, and individuals' use of electronic tools and applications. The results also showed that the usefulness and ease of use associated with SANAD e-services are positively related to individuals' attitude toward adopting these services. These findings are consistent with Purwanto & Budiman (2020), who found a significant relationship between usefulness, ease of use, and individuals' attitude toward adopting SANAD e-services.

6. Study Contribution

The study contributes to the current literature by identifying how perceived usefulness and ease of use influence individuals' behavior, suggesting that these factors act as mediating variables that influence individuals' intentions. This suggests a complex relationship between psychosocial factors and adoption behaviors in the context of global crises such as the COVID-19 pandemic conditions.

The study is particularly important because it provides a theoretical framework that describes the interactions between individuals and their aspirations to use e-services provided by SANAD and their fear of the COVID-19 pandemic.

Our study supports several studies on the use of e-services in developing countries that have indicated that in the case of COVID-19, e-applications may be one way to provide citizens with access to services while maintaining social distancing (Gadabu, Songoh, Arkoorful, Odin, & Lockman, 2019). As well as those that have examined the use of e-media for health and other services by many individuals throughout the COVID-19 pandemic (Mead, Varnam, Rogers, & Roland, 2003).

The motivation for this study is that the SANAD application involves working during a risk range such as COVID-19.

The importance of this study's results also stems from the fact that both the government and users seek to use technology to facilitate procedures and achieve well-being. The results of the study may be useful to governments, academics, app producers, and app users in general.

Therefore, by using users' perspectives on the SANAD app as a basis for future studies and discoveries, researchers and app developers may redesign and improve the app. The government can use the results of this study to increase user acceptance of the app and gain a deeper understanding of the user.

Finally, the results indicate that when users perceive the potential benefits of using apps, such as improving productivity or facilitating daily life, they are more willing to adopt technology.

The empirical results provide key findings where attitude toward the SANAD app is influenced by expectations of ease of use and perceived usefulness, and attitude also affects intention to use.

Based on the above, this research relies on valid and reliable measures taken from TAM where the researcher examined whether expectations of perceived usefulness and ease of use affect attitude toward the SANAD app and its effect on intention to use as mediating variables.

The study includes a perception of how fear of COVID-19 affects individuals' attitude and behavioral intention towards adopting SANAD e-services, where both perceived ease of use (PEU) and perceived usefulness (PU) are mediating factors in this context. The results suggest that fear of COVID-19 can influence how individuals perceive the usefulness and ease of use of these services, which enhances their intention to use them. The results of this study are consistent with previous research that has used the Technology Acceptance Model (TAM) in the context of e-health, such as adoption research (Chen & Hsiao, 2012; Wu, Wang, & Lin, 2007). Previous studies have shown that both PEU and PU can predict individuals' intention to use these services. For example, Davis and Venkatesh (2004) indicated that perceived usefulness and ease of use play a crucial role in shaping the intention to use technology. Zobair et al. (2019) also confirmed that PU is a key predictor of individuals' intention to use e-health services, meaning that the more useful these services are, the more likely they are to use them.

Furthermore, Wilson and Lankton (2009) showed that intrinsic motivation and general motivation are important factors for individuals' intention to use e-services. Evidence suggests that the more users perceive the usefulness and ease of use of technology, the more likely they are to use it.

This study also contributes to the literature on technology adoption by identifying the mediating mechanisms between PEU, fear of COVID-19, and attitudes toward adopting e-Sanad services. It also highlights the importance of developing effective e-applications and tools that meet users' needs and help them cope with the daily challenges posed by COVID-19. Overall, the findings confirm that e-Sanad services are a dynamic tool for individuals during crises such as the COVID-19 pandemic.

7. LIMITATIONS, FUTURE DIRECTIONS AND RECOMMENDATIONS:

Research limitations include factors that limit researchers' ability to achieve their research objectives. These limitations may be the result of multiple factors, such as:

Research design and methodology: Inappropriate research methodologies can lead to unreliable results, which necessitated the recognition of these limitations in our research to increase the credibility of the study, as the time factor plays an important role in filling out the questionnaire and any choice made by respondents to shorten the time.

7.1 Future Directions:

Regarding the application of SANAD, there are several future directions that can affect how research is conducted and the results are applied:

Developing new methodologies: The development of new research methods based on statistical analysis and modern methods is not only a scientific necessity but an investment in the future of human knowledge. By enhancing understanding and offering innovative solutions, we can address current and future challenges more effectively.

7.2 Future studies: Future studies should focus on using scientific methods to anticipate future problems, which helps decision makers make informed decisions.

Integration between disciplines: Research is moving towards integration between different scientific disciplines, understanding this dynamic helps strengthen legal systems and ensure they respond to the changing needs of society.

7.3 Research Limitations: The current research limitations and future trends in the application of SANAD require special attention from researchers. They should recognize these limitations and work to develop effective strategies to overcome them, which contributes to improving the quality of research and ensuring more accurate and reliable results.

The SANAD electronic application in Jordan represents an important step towards digital transformation in providing government services.

The following are some recommendations for the government to improve the service and for future research to develop the current research by expanding our research variables and building on the conceptual model of our study:

1. Evaluating the effectiveness of the application: User analysis: studying users' experiences and assessing their satisfaction with the services provided through the application. Performance measurement: using key performance indicators (kpis) to measure the effectiveness of the application in accelerating government procedures.

2. Economic impact study: cost-benefit analysis: studying the costs associated with the SANAD application compared to the potential economic benefits at the level of individuals and government agencies. Impact of digitization on the local economy: analyzing how digital services can contribute to strengthening the Jordanian economy.

3. Improving the user experience: User interface design: Conducting research on how to improve the user interface to make it easier and more suitable for different age groups. Providing technical support: studying the effectiveness of technical support channels available to users and how to improve them.

4. Security and privacy: security risk analysis: studying the security challenges associated with the use of digital identity and electronic signature. Data protection strategies: developing strategies to protect users' personal data and ensure privacy.

5. Expanding services: Expanding the scope of services provided; researching the possibility of adding new services to the application based on citizens' needs. Cooperation with the private sector: Studying how to enhance cooperation between the government and the private sector to expand the scope of digital services.

6. Assessing the digital infrastructure: Analysis of the current infrastructure: Studying the readiness of the digital infrastructure in Jordan to support applications such as SANAD. Exploring new technologies: searching for new technologies that can enhance the application's performance and expand its services.

7. Impact of education and awareness: Awareness programs: Studying the effectiveness of awareness programs on the use of the SANAD application and their impact on the rate of its use. Digital education: Analyzing the role of digital education in developing citizens' skills to use electronic services efficiently. These recommendations aim to enhance a comprehensive understanding of the SANAD electronic application and provide valuable insights to improve and develop it in line with the needs of Jordanian society.

8. Conclusion

This study is organized as follows: The first part provides an abstract and introduction about the topic of Covid-19 and the SANAD application as one of the e-government applications in Jordan, while the second part discusses both: suggested model and the theoretical framework. The third part of the research covers the survey design and methodology, which includes the measurement questions, participants, procedures, and research environment.

The fourth section includes the results and data analysis along with the results of the SEM analysis. Finally, the fifth section presents the conclusions of the study, its future, and recommendations.

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